Owner's Manual & Safety Instructions

Save This Manual Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

REV 16f

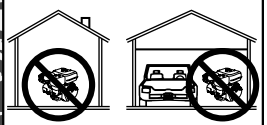
PREDATOR®
OUTDOOR POWER EQUIPMENT

20 Ton
LOG SPLITTER

⚠ DANGER

Using an engine indoors CAN KILL YOU IN MINUTES.

Engine exhaust contains carbon monoxide. This is a poison you cannot see or smell.



NEVER use inside a home or garage, EVEN IF doors and windows are open.

Only use OUTSIDE and far away from windows, doors, and vents.

Visit our website at: http://www.harborfreight.com
Email our technical support at: productsupport@harborfreight.com

61594

When unpacking, make sure that the product is intact and undamaged. If any parts are missing or broken, please call 1-888-866-5797 as soon as possible.

Diagrams within this manual may not be drawn proportionally. Due to continuing improvements, actual product may differ slightly from the product described herein. Tools required for assembly and service may not be included.

⚠ WARNING

Read this material before using this product. Failure to do so can result in serious injury. SAVE THIS MANUAL.

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Specifications

Log Splitter Specifications

Ram Travel	21.85"
Log Capacity	23.6" L x 16" Diameter
Towing	For off-road use only (not DOT approved); maximum speed 45 mph
Hitch Ball Size	2"
Hydraulic Fluid Reservoir	2.25 gallons (8.5 L)
Type of Hydraulic Fluid	10W AW32, ASLE H-150 or ISO32 Hydraulic Fluid
Wheel Size	15.5" x 4"
Tire Size	4.80-8
Required Tire Air Pressure	60 PSI, Cold
Weight	378 lb (filled with fluid)

Engine Specifications

Displacement		212 cc
Engine Type		Horizontal Single Cylinder 4-stroke OHV Meets EPA phase III emissions standards
Cooling System		Forced air cooled
Fuel	Type	87+ octane unleaded gasoline
	Capacity	0.9 Gallon (3.6 Liter)
Engine Oil	Type SAE	10W-30 above 32° F 5W-30 at 32° F or below
	Capacity	0.5 Quart
Run Time @ 50% Load with full tank		3 hr.
Sound Level at 22 feet		104 dB
Bore x Stroke		70 mm x 55 mm
Compression Ratio		8.5:1
Rotation viewed from PTO (power takeoff - the output shaft)		Counterclockwise
Spark Plug	Type	NGK® BP-6ES NHSP® / Torch® F6TC
	Gap	0.027" – 0.031"
Valve Clearance	Intake	0.004" – 0.006"
	Exhaust	0.006" – 0.008"
Speed	Idle	1800 ± 50 RPM

The emissions control system for this Engine is warranted for standards set by the U.S. Environmental Protection Agency. For warranty information, refer to the last pages of this manual.

WARNING SYMBOLS AND DEFINITIONS	
⚠	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
⚠ DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE CAUTION	Addresses practices not related to personal injury.

Symbol Definitions

Symbol	Property or Statement
RPM	Revolutions Per Minute
HP	Horsepower
	Read the manual before set-up and/or use.
	WARNING marking concerning Risk of Eye Injury. Wear ANSI-approved safety goggles with side shields.
	WARNING marking concerning Risk of Facial Injury from flying debris. Wear ANSI-approved full face shield.
	WARNING marking concerning Risk of Hearing Loss. Wear hearing protection.
	WARNING marking concerning Risk of Foot Injury. Wear steel-toe work boots.

Symbol	Property or Statement
	WARNING marking concerning Risk of Hand Injury. Wear heavy-duty work gloves.
	WARNING marking concerning Crushing Hazard. Keep hands and feet away from moving parts.
	WARNING marking concerning Risk of Respiratory Injury. Operate engine OUTSIDE and far away from windows, doors, and vents.
	WARNING marking concerning Risk of Fire while handling fuel. Do not smoke while handling fuel.
	WARNING marking concerning Risk of Fire. Do not refuel while operating. Keep flammable objects away from engine.

IMPORTANT SAFETY INSTRUCTIONS

WARNING! Read all instructions.
Failure to follow all instructions listed below may result in fire, serious injury and/or DEATH.
The warnings and precautions discussed in this manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

SAVE THESE INSTRUCTIONS

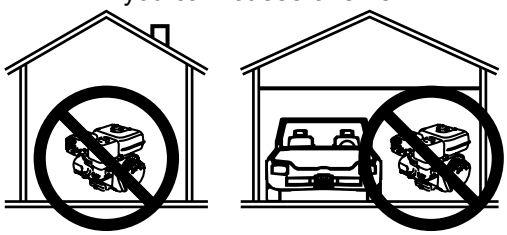
Set Up Precautions

1. Gasoline fuel and fumes are flammable, and potentially explosive. Use proper fuel storage and handling procedures. Do not store fuel or other flammable materials nearby.
2. Have multiple ABC class fire extinguishers nearby.
3. Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrestor may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements.
4. Set up and operate only in a well-ventilated area on a level, dry and solid surface with wheels chocked.
5. Wear ANSI-approved safety goggles, heavy-duty work gloves, and dust mask/respirator during set up.
6. Use only lubricants and fuel recommended in the Specifications chart of this manual.

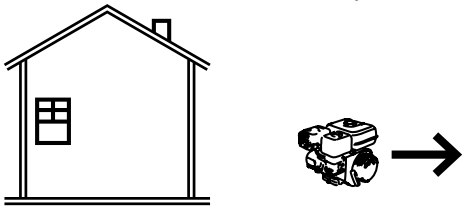
Operating Precautions

1. 

CARBON MONOXIDE HAZARD
Using an engine indoors
CAN KILL YOU IN MINUTES.
Engine exhaust contains carbon monoxide. This is a poison you cannot see or smell.



NEVER use inside a home or garage, EVEN IF doors and windows are open.



Only use OUTSIDE and far away from windows, doors, and vents.

2. Keep children away from the equipment, especially while it is operating.
3. **DO NOT OPERATE WITH ANY GUARD DISABLED, DAMAGED, OR REMOVED. Keep guards in place and in good working order.**
4. Wear ANSI-approved safety goggles under full face shield, heavy-duty work gloves and steel-toe work boots during use.
5. Keep clear of moving parts and log during operation. Crushing hazard.
6. Do not check for hydraulic leak with hands. High-pressure fluid can be forced under the skin resulting in serious injury. Inspect hydraulic lines for leakage before use; do not use if leaks found.
7. Do not split wood containing foreign objects (nails, for example).
8. Do not use Splitter on logs longer than 23.6" or with a diameter greater than 16".
9. Hold the rounded, bark side of logs when loading or positioning, never the ends. Do not place hands or any body parts between a log and any part of the Log Splitter.
10. Do not load or unload logs while the splitter wedge is moving.
11. Do not split logs across the grain. Doing so will damage the Log Splitter and could cause pieces of log to be thrown, injuring the operator or bystanders.
12. Do not split more than one log at a time. A piece of log can unexpectedly be thrown from the machine, causing severe personal injury.
13. Remove split logs away from the Log Splitter immediately. Split logs left near the Log Splitter are a tripping hazard.
14. Do not tow the Log Splitter on roads or highways. This product is not D.O.T. compliant.
15. Keep bystanders away during operation.
16. Fire Hazard! Do not fill gas tank while engine is running. Do not operate if gasoline has been spilled. Clean spilled gasoline before starting engine. Do not operate near pilot light or open flame.
17. Do not touch engine during use. Let engine cool down after use.
18. Never store fuel or other flammable materials near the engine.
19. Industrial applications must follow OSHA requirements.
20. Do not leave the equipment unattended when it is running. Turn off the equipment (and remove safety keys, if available) before leaving the work area.
21. The equipment can produce high noise levels. Prolonged exposure to noise levels above 85 dBA is hazardous to hearing. Wear ear protection when operating the equipment or when working nearby while it is operating.

Operating Precautions (continued)

22. People with pacemakers should consult their physician(s) before use. Electromagnetic fields in close proximity to a heart pacemaker could cause pacemaker interference or pacemaker failure. Caution is necessary when near the engine's magneto or recoil starter.
23. Use only accessories that are recommended by Harbor Freight Tools for your model. Accessories that may be suitable for one piece of equipment may become hazardous when used on another piece of equipment.
24. Do not operate in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust. Gasoline-powered engines may ignite the dust or fumes.
25. Stay alert, watch what you are doing and use common sense when operating this piece of equipment. Do not use while tired or under the influence of drugs, alcohol or medication.
26. Do not overreach. Keep proper footing and balance at all times. This enables better control of the equipment in unexpected situations.
27. Use this equipment with both hands only. Using equipment with only one hand can easily result in loss of control.
28. Dress properly. Do not wear loose clothing or jewelry. Keep hair, clothing and gloves away from moving parts. Loose clothes, jewelry or long hair can be caught in moving parts.
29. Parts, especially exhaust system components, get very hot during use. Stay clear of hot parts.
30. Do not cover the equipment during operation.
31. Keep the equipment, engine, and surrounding area clean at all times.
32. Do not smoke, or allow sparks, flames, or other sources of ignition around the equipment, especially when refuelling.
33. Use the equipment, accessories, etc., in accordance with these instructions and in the manner intended for the particular type of equipment, taking into account the working conditions and the work to be performed. Use of the equipment for operations different from those intended could result in a hazardous situation.
34. Do not operate the equipment with known leaks in the engine's fuel system.
35. WARNING: This product contains or, when used, produces a chemical known to the State of California to cause cancer and birth defects or other reproductive harm. (California Health & Safety Code § 25249.5, *et seq.*)
36. When spills of fuel or oil occur, they must be cleaned up immediately. Dispose of fluids and cleaning materials as per any local, state, or federal codes and regulations. Store oil rags in a bottom-ventilated, covered, metal container.
37. Keep hands and feet away from moving parts. Do not reach over or across equipment while operating.
38. Before use, check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the equipment's operation. **If damaged, have the equipment serviced before using.** Many accidents are caused by poorly maintained equipment.
39. Use the correct equipment for the application. Do not modify the equipment and do not use the equipment for a purpose for which it is not intended.

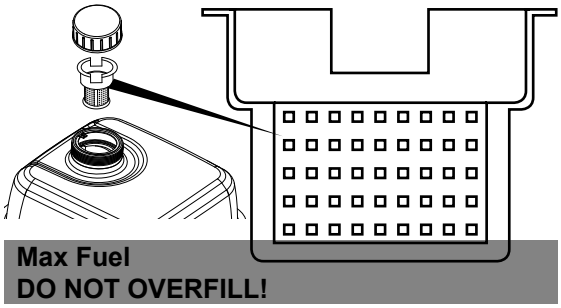
Service Precautions

1. **Before service, maintenance, or cleaning:**
   a. **Turn the engine switch to its "OFF" position.**
   b. **Allow the engine to completely cool.**
   c. **Then, remove the spark plug cap from the spark plug.**
2. Keep all safety guards in place and in proper working order. Safety guards include muffler, air cleaner, mechanical guards, and heat shields, among other guards.
3. **Do not alter or adjust any part of the equipment or its engine that is sealed by the manufacturer or distributor. Only a qualified service technician may adjust parts that may increase or decrease governed engine speed.**
4. Wear ANSI-approved safety goggles, heavy-duty work gloves, and dust mask/respirator during service.
5. Maintain labels and nameplates on the equipment. These carry important information. If unreadable or missing, contact Harbor Freight Tools for a replacement.
6. Have the equipment serviced by a qualified repair person using only identical replacement parts. This will ensure that the safety of the equipment is maintained. Do not attempt any service or maintenance procedures not explained in this manual or any procedures that you are uncertain about your ability to perform safely or correctly.
7. Store equipment out of the reach of children.
8. Follow scheduled engine and equipment maintenance.

Service Precautions (continued)

Refueling:

1. Do not refill the fuel tank while the engine is running or hot.
2. Do not smoke, or allow sparks, flames, or other sources of ignition around the equipment, especially when refuelling.
3. **Do not fill fuel tank to the top.** Leave a little room for the fuel to expand as needed. **TO PREVENT FUEL LEAKAGE AND FIRE HAZARD, do not fill fuel above the bottom of fuel strainer.**



4. Refuel in a well-ventilated area only.
5. Wipe up any spilled fuel and allow excess to evaporate before starting engine. **To prevent FIRE, do not start the engine while the smell of fuel hangs in the air.**

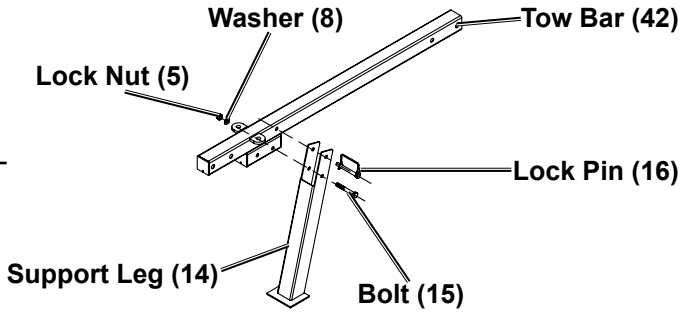
⚠ SAVE THESE INSTRUCTIONS.

PREDATOR®
OUTDOOR POWER EQUIPMENT

Read the ENTIRE IMPORTANT SAFETY INFORMATION section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

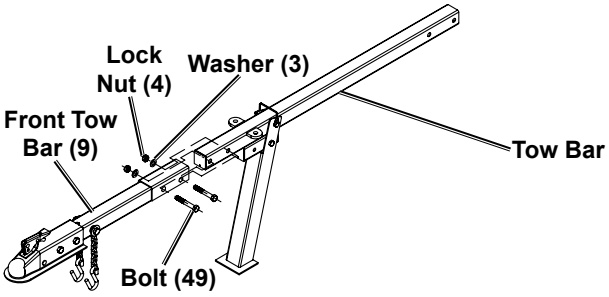
Assembly

1. Use Bolt (15) and Lock Pin (16) to attach the Support Leg (14) underneath the Tow Bar (42). Secure the Bolt using Washer (8) and Lock Nut (5) and secure the Lock Pin using its clip.



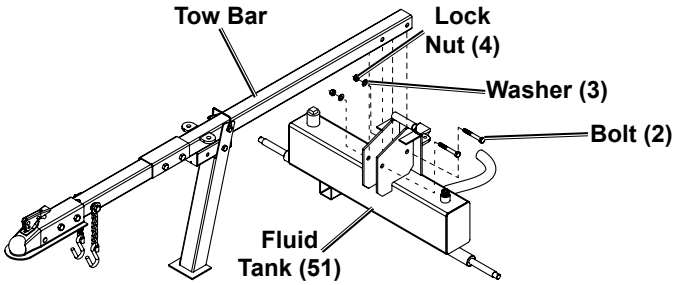
Assembly Step 1: Attach Support Leg

2. Attach Front Tow Bar (9) to end of Tow Bar using Bolts (49), Washers (3), and Lock Nuts (4).



Assembly Step 2: Attach Front Tow Bar

3. Attach Tow Bar to bracket on top of Fluid Tank (51) using Bolts (2), Washers (3), and Lock Nuts (4).



Assembly Step 3: Attach Fluid Tank

4. **Wheel Assembly:**

   a. Pack grease into the center of one Wheel's (48) hub from both sides.

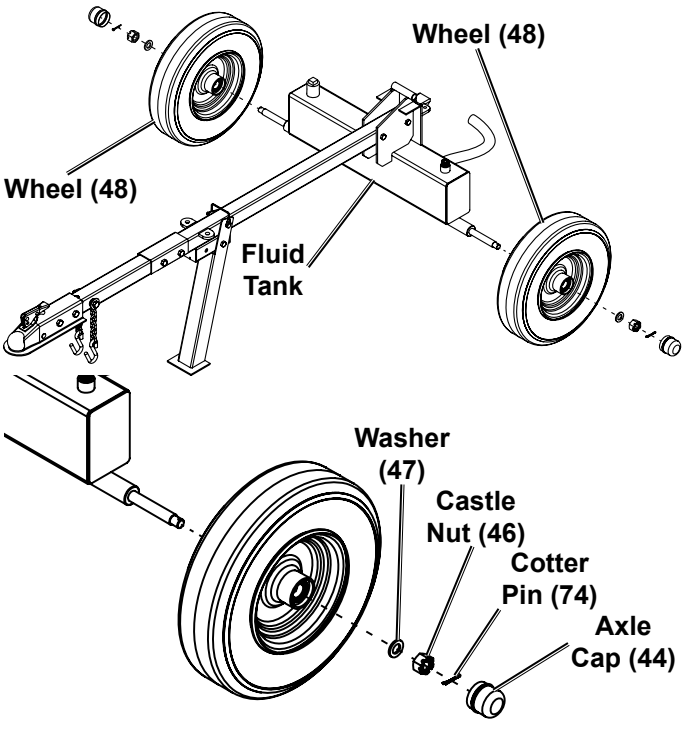
   b. Slide the Wheel onto an axle on the Fluid Tank.

   c. Place a Washer (47), then a Castle Nut (46) onto the axle.

   d. Tighten the Castle Nut until the Wheel can spin with slight resistance. Loosen the Castle Nut about 1/6 turn from the point resistance is felt, and insert the Cotter Pin (74).

   e. Bend the end of the Cotter Pin back to lock it in place.

   f. Press the Axle Cap (44) securely in place.



Assembly Step 4: Attach Wheels

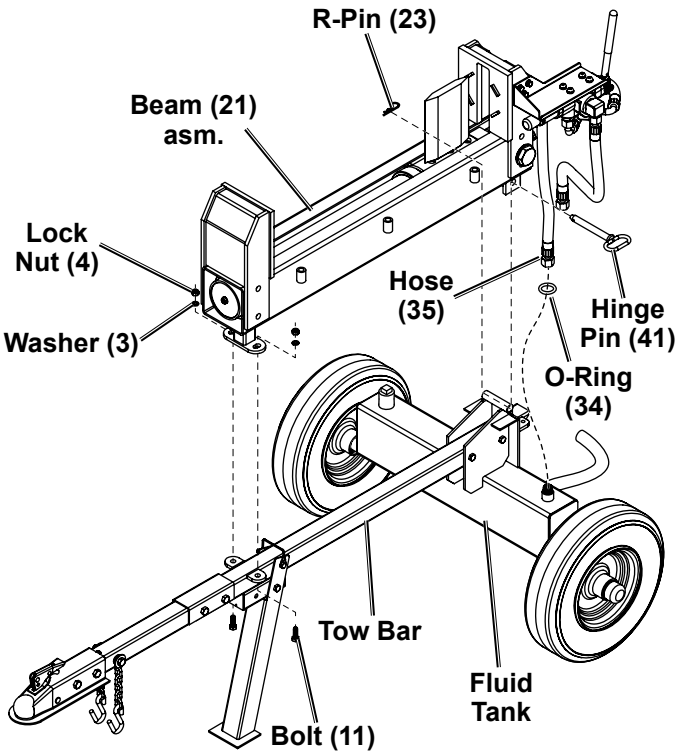
5. **Beam Assembly:**

   a. Place Beam (21) assembly on top of the Fluid Tank and Tow Bar.

   b. Line up the bracket underneath the Beam with the tube at the top of the Fluid Tank, and insert the Hinge Pin (41). Secure the Hinge Pin with the R-Pin (23).

   c. Secure the brackets at the front of the Tow Bar together using Bolts (11), Washers (3), and Lock Nuts (4).

   d. Attach the O-Ring (34) and Hose (35) marked "Fluid Tank" to the threaded connector at the top of the Fluid Tank. Wrench-tighten it securely.



Assembly Step 5: Attach Beam Assembly

6. **Engine and Pump Assembly:**

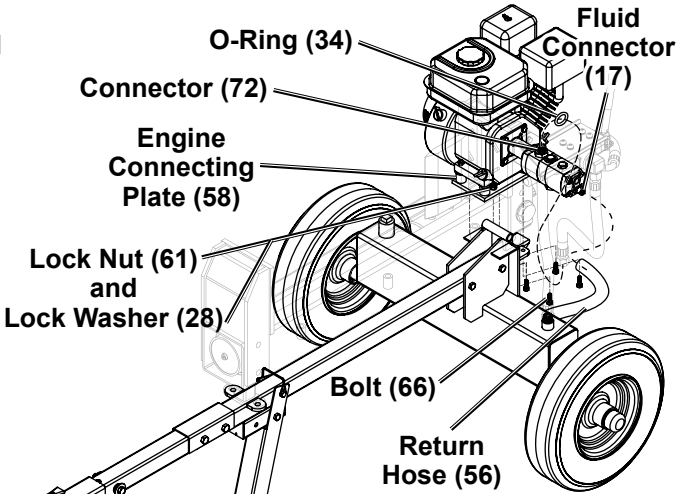
   a. Attach Engine Connecting Plate (58) to the pedestal on the back of the Fluid Tank using Bolts (66), Lock Washers (28), and Lock Nuts (61).

   b. Slide a Hose Clamp (57) over the Return Hose (56).

   c. Slip the Return Hose over the Fluid Connector (17).

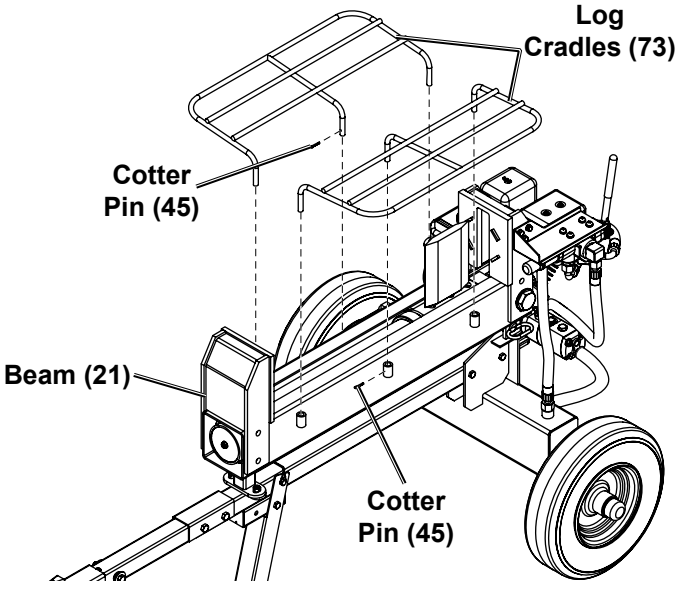
   d. Slide the Hose Clamp over the connection, and tighten its screw to secure it in place.

   e. Attach an O-Ring (34) to the Connector (72) on the Hydraulic Pump (59). Connect the unconnected Hose (38) marked "Pump" from the Control Valve (32) to the Connector on the Hydraulic Pump. Wrench-tighten it securely.



Assembly Step 6: Attach Engine and Pump

7. Insert the Log Cradles (73) into the brackets on the sides of the Beam (21) angled outward. Secure them in place with a Cotter Pin (45). Bend the Cotter Pins back to secure them in place.



Assembly Step 7: Attach Log Cradles

High Altitude Operation Above 3000 feet

⚠WARNING! TO PREVENT SERIOUS INJURY FROM FIRE:
Follow instructions in a well-ventilated area away from ignition sources.
If the engine is hot from use, shut the engine off and wait for it to cool before proceeding. Do not smoke.

NOTICE: Warranty void if necessary adjustments are not made for high altitude use.

At high altitudes, the engine's carburetor, governor (if so equipped), and any other parts that control the fuel-air ratio will need to be adjusted by a qualified mechanic to allow efficient high-altitude use and to prevent damage to the engine and any other devices used with this product. The fuel system on this engine may be influenced by operation at higher altitudes. Proper operation can be ensured by installing an altitude kit at altitudes higher than 3000 feet above sea level. At elevations above 8000 feet, the engine may experience decreased performance, even with the proper main jet. Operating this engine without the proper altitude kit installed may increase the engine's emissions and decrease fuel economy and performance. The kit should be installed by a qualified mechanic.

1. Turn off the engine.
2. Close the fuel valve.
3. Place a bowl under the fuel cup to catch any spilled fuel.

CAUTION! Carburetor bowl may have gas in it which will leak upon removing the bolt.

4. Unthread the bolt holding the fuel cup.
5. Remove the bolt, Bolt Seal, fuel cup, Fuel Cup Seal and Main Jet from the body of the carburetor assembly. A carburetor screwdriver (not included) is needed to remove and install the Main Jet.

Note: The mixing tube is held in place by the Main Jet and might fall out when it is removed. If it falls out, replace it in the same orientation before replacing the Main Jet.

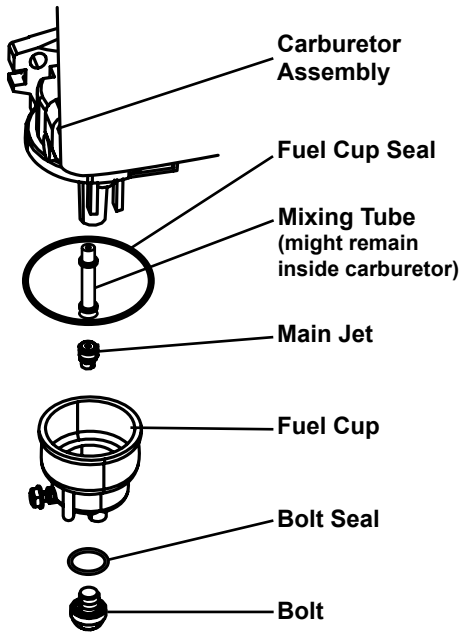
6. Replace the Main Jet with the replacement Main Jet needed for your altitude range (part 1a or 2a).

Note: The Fuel Cup Seal and Bolt Seal may be damaged during removal and should be replaced with the new ones from the kit.

7. Replace the Fuel Cup Seal (4a), fuel cup, Bolt Seal (3a), and bolt. Tighten in place.

NOTICE: Do not cross thread bolt when tightening. Finger tighten first and then use a wrench to make sure the bolt is properly threaded.

8. Wipe up any spilled fuel and allow excess to evaporate before starting engine. To prevent FIRE, do not start the engine while the smell of fuel hangs in the air.



High Altitude Kit Parts List - A

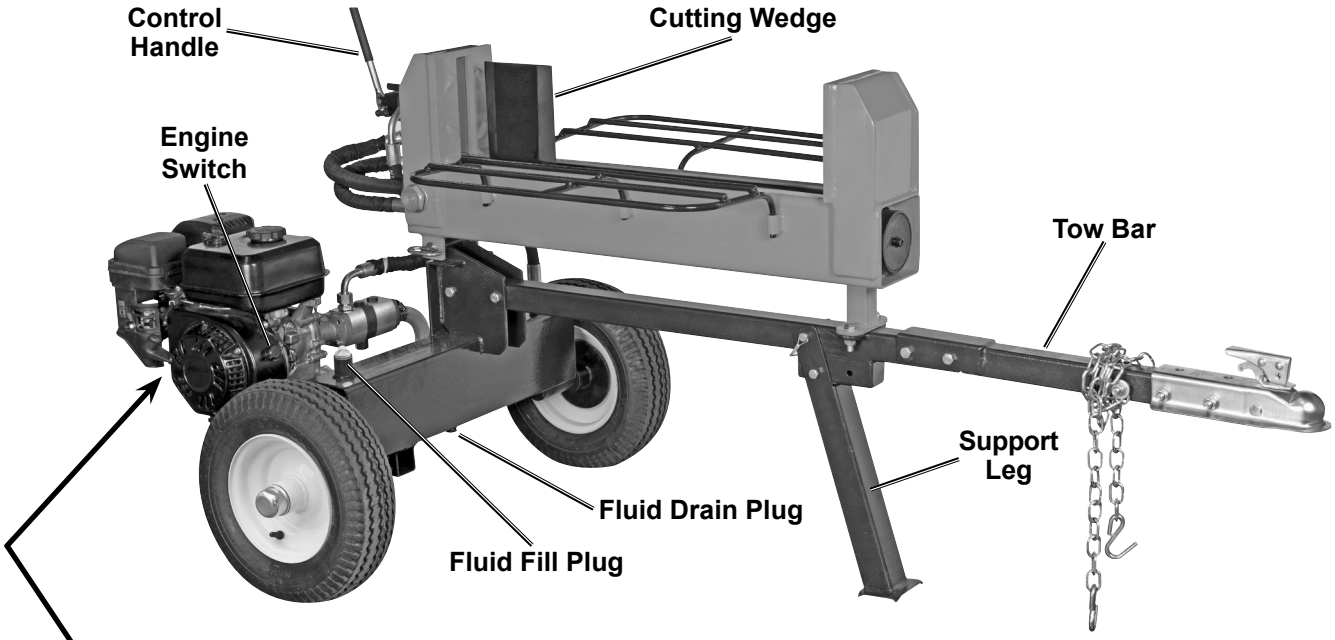
Part	Description	Qty
1a	Main Jet 3000-6000 ft.	1
2a	Main Jet 6000-8000 ft.	1
3a	Bolt Seal	1
4a	Fuel Cup Seal	1

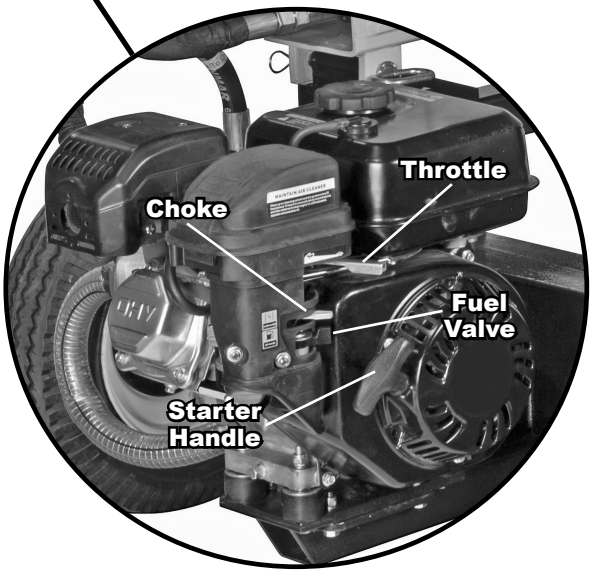
⚠WARNING

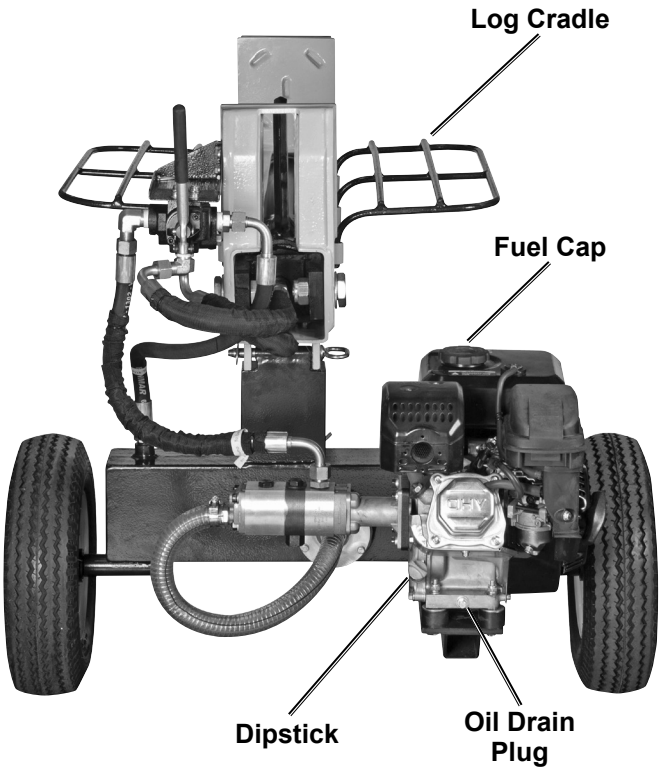
TO PREVENT SERIOUS INJURY:
Operate only with proper spark arrestor installed.

Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrestor may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements.

Components and Controls







Read the ENTIRE IMPORTANT SAFETY INFORMATION section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

Workpiece and Work Area Set Up

1. Designate a work area that is clean and well-lit. The work area must not allow access by children or pets to prevent distraction and injury.
2. There must not be objects, such as utility lines, nearby that will present a hazard while working.
3. Maximum log size for this Log Splitter is 23.6" long and 16" in diameter. Attempting to cut logs that exceed those measurements is dangerous and may damage the Log Splitter.
4. Use a chainsaw (not included) to cut logs square on each end before splitting. Log ends that are not cut square can slide out while splitting and cause a safety hazard or cause excessive force to Log Splitter components.
5. Do not split wood containing foreign objects (nails, for example). Do not use odd-shaped, uneven logs or logs that are knotted or curved.

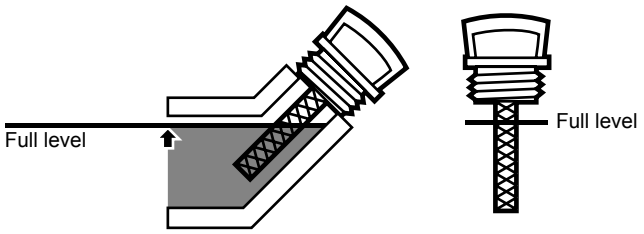
Engine and Equipment Pre-Start Checks

Inspect engine and equipment looking for damaged, loose, and missing parts before set up and starting. If any problems are found, do not use equipment until fixed properly.

Checking and Filling Engine Oil

NOTICE: Your Warranty is VOID if the engine's crankcase is not properly filled with oil before each use. Before each use, check the oil level. Engine **will not start with low or no engine oil.**

1. Make sure the engine is stopped and is level.
2. Close the Fuel Valve.
3. Clean the top of the Dipstick and the area around it. Remove the Dipstick by turning it counterclockwise, and wipe it off with a clean, lint free rag.



4. Reinsert the Dipstick without threading it in and remove it to check the oil level. The oil level should be up to the full level as shown above.
5. If the oil level is at or below the low mark add the appropriate type of oil until the oil level is at the proper level. SAE 10W-30 oil is recommended for general use. (The SAE Viscosity Grade chart on page 20 in the Maintenance section shows other viscosities to use in different average temperatures.)
6. Thread the dipstick back in clockwise.

NOTICE: Do not run the engine with too little oil. Engine **will shut off if engine oil level is too low.**

Checking and Filling Fuel

WARNING! TO PREVENT SERIOUS INJURY FROM FIRE:
Fill the fuel tank in a well-ventilated area away from ignition sources. If the engine is hot from use, shut the engine off and wait for it to cool before adding fuel. Do not smoke.

1. Clean the Fuel Cap and the area around it.
2. Unscrew and remove the Fuel Cap.
3. Remove the Strainer and remove any dirt and debris. Then replace the Strainer.

Note: Do not use gasoline containing more than 10% ethanol (E10). Do not use E85 ethanol. Add fuel stabilizer to the gasoline or the Warranty is VOID.

Note: Do not use gasoline that has been stored in a metal fuel container or a dirty fuel container. It can cause particles to enter the carburetor, affecting engine performance and/or causing damage.

4. If needed, fill the Fuel Tank to about 1 inch under the fill neck of the Fuel Tank with 87 octane or higher unleaded gasoline that has been treated with a fuel stabilizer additive. Follow fuel stabilizer manufacturer's recommendations for use.
5. Then replace the Fuel Cap.
6. Wipe up any spilled fuel and allow excess to evaporate before starting engine. To prevent FIRE, do not start the engine while the smell of fuel hangs in the air.

Engine and Equipment Pre-Start Checks (continued)

Checking and Filling Hydraulic Fluid

NOTICE: Your Warranty is VOID if the Log Splitter's hydraulic fluid tank is not properly filled with fluid before each use. BEFORE FIRST USE, FLUID TANK MUST BE FILLED WITH HYDRAULIC FLUID (NOT INCLUDED). Before each use thereafter, check the hydraulic fluid level of the Log Splitter when fluid is cold. Operating without sufficient fluid in the reservoir can badly damage the pump.

1. Fluid Tank comes empty. To add hydraulic fluid before first use:
   a. Make sure the Log Splitter is level.
   b. Remove the Fluid Fill Plug from the Fluid Tank.
   c. Fill the Tank with hydraulic fluid (not included). Refer to the Specifications chart of this manual for amount and type of fluid to use.
   d. Replace the Fluid Fill Plug.
2. To check fluid level before each subsequent use:
   a. Make sure the Log Splitter is level.
   b. Remove the Fluid Fill Plug from the Fluid Tank.
   c. Check the hydraulic fluid level using the dipstick attached to the Fluid Fill Plug.
   d. Add sufficient fluid (not included) as needed to bring up to full level. Refer to the Specifications chart of this manual for type of fluid to use.
   e. Replace the Fluid Fill Plug.
3. After completing Step 1 or 2 above, start the Engine following directions in next section and use the Control Handle to cycle the Cutting Wedge forward and back several times to remove excess air from the Fluid Tank.
4. Retract the Cutting Wedge, turn the Engine Switch to its "OFF" position, and recheck the hydraulic fluid level and add fluid if necessary to bring up to full level.
5. Replace the Fluid Fill Plug.

WARNING! Do not open Fluid Tank while Log Splitter is running or while fluid is still hot from use.

Starting the Engine

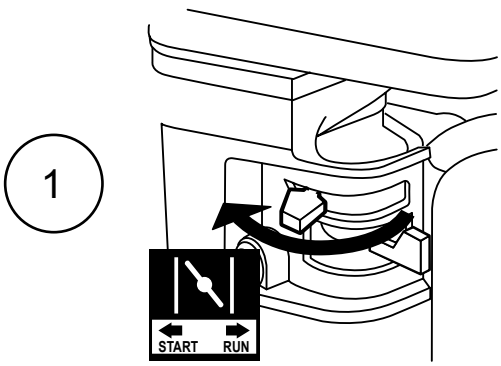
Before Starting the Engine

Before starting the engine:

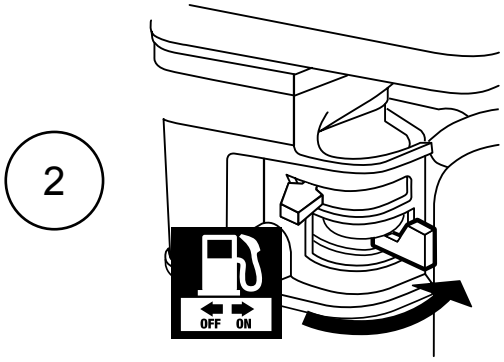
a. **Inspect the equipment and engine.**
b. **Fill the engine with the proper amount and type of both stabilizer-treated unleaded gasoline and oil.**
c. **Fill the Fluid Tank with the proper amount and type of hydraulic fluid.**

Manual Start

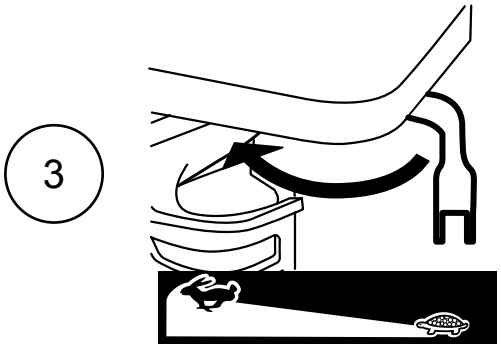
1. To start a cold engine, move the Choke to the CHOKE position.
   To restart a warm engine, leave the Choke in the RUN position.



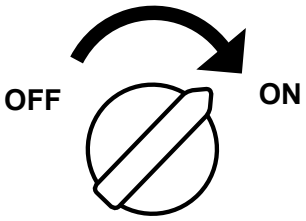
2. Open the Fuel Valve.

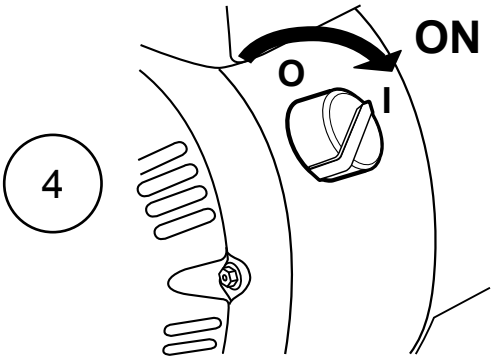


3. Slide the Throttle or Speed Control Lever to 1/3 away from the SLOW position (the “turtle”).



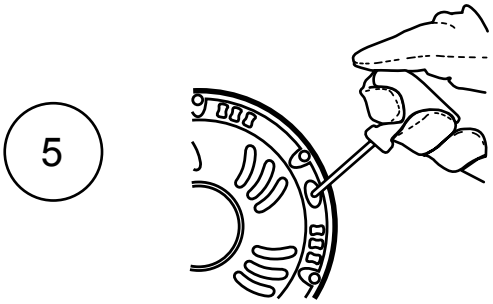
4. Turn the Engine Switch on.





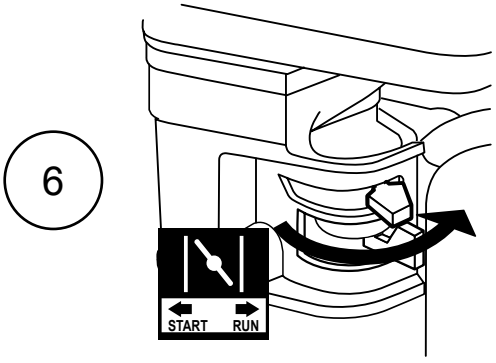
Note: If engine does not start, check engine oil level. Engine will not start with low or no engine oil.

5. Grip the Starter Handle of the Engine loosely and pull it slowly several times to allow the gasoline to flow into the Engine’s carburetor. Then pull the Starter Handle gently until resistance is felt. Allow Cable to retract fully and then pull it quickly. Repeat until the engine starts.



Note: Do not let the Starter Handle snap back against the engine. Hold it as it recoils so it doesn't hit the engine.

6. Allow the Engine to run for several seconds. Then, if the Choke lever is in the CHOKE position, move the Choke Lever very slowly to its RUN position.



Note: Moving the Choke Lever too fast could stall the engine.

IMPORTANT: Allow the engine to run at no load for five minutes with no load after each start-up so that the engine can stabilize.

7. Adjust the Throttle as needed.

Starting the Engine (continued)

Break-in Period:

a. Breaking-in the engine will help to ensure proper equipment and engine operation.

b. The operational break-in period will last about 3 hours of use. During this period:

- Do not apply a heavy load to the equipment.
- Do not operate the engine at its maximum speed.

c. The maintenance break-in period will last about 20 hours of use.

- Change the engine oil after this period.

Under normal operating conditions subsequent maintenance follows the schedule explained in the *Maintenance* section on page 18.

Log Splitter Operating Instructions

1. **Check the hydraulic fluid level; fill as necessary.**
2. Ensure that the Support Leg is down and place wheel chocks (not included) on each side of the wheels to keep the Log Splitter from moving.
3. Follow procedures in previous section to start the engine.

IMPORTANT: Hydraulic fluid temperature must be above 10° F (-12° C) before operating the Log Splitter or damage to the hydraulic pump may result. If outdoor temperature is below 32° F (0° C) use the Control Handle to cycle the Cutting Wedge forward and back several times to warm the hydraulic fluid before splitting wood.

4. Stand in the correct operator position as shown in Figure A when operating the Log Splitter.

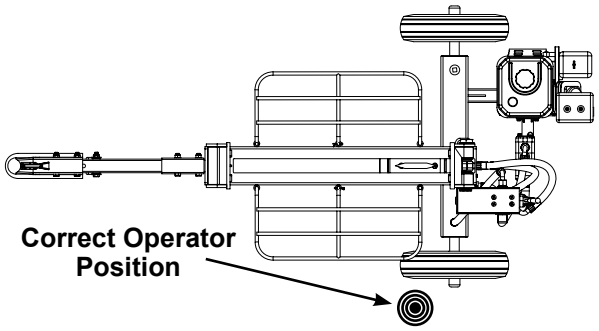


Figure A: Operator Position

5. Hold the rounded, bark side of log and position it lengthwise in the direction of the grain on the Beam of the Splitter between the Log Cradles. Place one end of log against the end plate.
6. The log must be stable so that it will split properly. Hold the top of the log at its center, if safe to do so. **Release log once Cutting Wedge engages it.**
7. Push the Control Handle forward to drive the Cutting Wedge forward into the log, splitting it.
8. Remove split log pieces and place the next log against the opposite end plate.
9. Push the Control Handle backward to drive the Cutting Wedge in the opposite direction into the log, splitting it.
10. Turn off the Log Splitter engine after use. Clean, then cover the tool and store in a dry, level, well-ventilated area out of reach of children.

Removing a Stuck Log

A log that is too stringy or tough to split completely can become stuck on the Cutting Wedge if the Wedge becomes embedded in the log and the log doesn't completely split and separate. If this happens, follow the directions below.

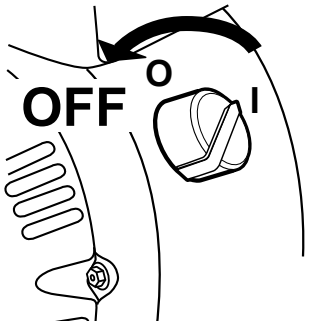
1. Relieve pressure on log and end plate by retracting Cutting Wedge slightly.
2. Turn the Engine Switch to its "OFF" position and disconnect the spark plug cap.
3. Remove the stuck log from the Cutting Wedge manually with a sledge hammer and pry bar.

WARNING! Be extremely careful when removing the log as pieces may fly off as they separate from the Wedge. Never attempt to remove a stuck log by using the hydraulic force of the Log Splitter, modifying the Log Splitter, or adding attachments to the Log Splitter. Personal injury could result from log or metal pieces flying out at high speed, or the Log Splitter could become damaged.

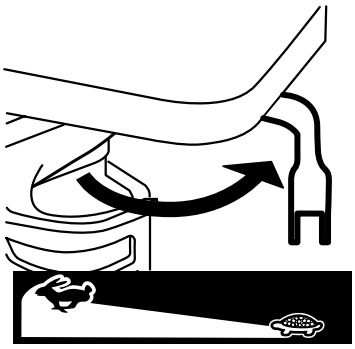
4. Do not attempt to re-split a stuck log once it has been removed from the Wedge. Manually split with a maul, or cut with a chainsaw.

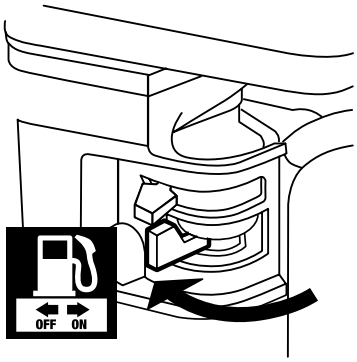
Stopping the Engine

1. To stop the engine in an emergency, turn the Engine Switch off.



2. Under normal conditions, use the following procedure:
   a. Slide the Throttle or Speed Control Lever to SLOW (the “turtle”).
   b. Turn the Engine Switch off.
   c. Close the Fuel Valve.
   d. Stay clear of Cutting Wedge while moving Control Handle back and forth to relieve hydraulic pressure.





NOTICE

See Long-Term Storage on page 21 for complete storage instructions.

Towing

DO NOT TRANSPORT THE LOG SPLITTER ON PUBLIC ROADS. The Log Splitter is not certified by the Department of Transportation for use on public roads.

1. Check tire condition and air pressure.
2. Make sure wheel lug nuts/bolts are properly tightened.
3. Make sure hitch, coupler, tow bar, and other equipment that connect the Log Splitter and the tow vehicle are properly secured and adjusted.
4. Before towing the Log Splitter, remove the Lock Pin (16) and lift the Support Leg (14) up so that it is parallel to the Beam Assembly. Then, replace the Lock Pin into the Horizontal Transport Hole and secure using its clip. Refer to Figure B.

WARNING! The Support Leg must always be secured in the horizontal position for towing and returned to the down position before use.

5. Make sure the hitch (not included) is compatible with the Hitch Coupler. The Coupler will accept a 2 inch hitch ball.
6. Pull up and down on the Hitch Coupler to make sure the hitch ball is fitting snugly in the Hitch Coupler. There should be no play between the hitch ball and Hitch Coupler.
7. Empty fuel tank before towing. Do not carry cargo or wood on Log Splitter.
8. Always use the Safety Chains during towing. Do not tow the Log Splitter at speeds above 45 MPH.
9. Follow all safety warnings for towing in the towing vehicle manufacturer's manual.

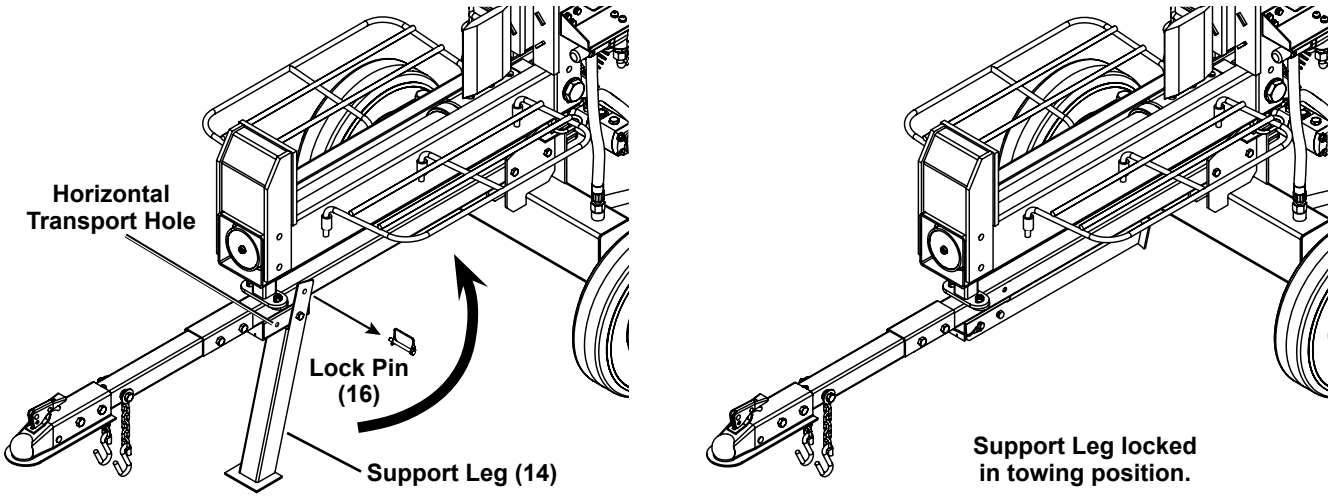


Figure B: Preparation for Towing

Tire Care

Checking Tire Pressure

Note: Underinflated tires can decrease handling, stopping performance, traction, tire life, and load-carrying capability, in addition to causing other negative and hazardous effects, including tire failure. Overinflated tires are at greater risk of an impact break, where the tread and casing break when striking a hard edge, often opening a huge gash across the tread. Incorrect inflation pressure also increases tires wear rate. Therefore, it is important to keep tires inflated properly.

Check all tires' pressure at least monthly, due to the following factors:

- Most tires naturally lose air gradually.
- Tires can suddenly lose air if the tire strikes a pothole, curb, or other object.
- It is usually not possible to determine underinflation of radial tires by visual inspection.

This Log Splitter has 60 PSI recommended cold tire inflation pressure. The term "cold" in this manual does not refer to the temperature outside, but it refers to the fact that a tire that has not been driven for a period is cooler (and therefore has lower pressure) than a tire that has been driven on. Tires heat up while being driven on. To check (or fill to) a tire's cold inflation, the tire must have not been driven for more than a mile or two for at least three hours. If you check a tires pressure when it is not "cold", the pressure will appear higher than the actual cold tire inflation.

Tire Care (continued)

Steps for Maintaining Proper Tire Pressure

1. Locate the recommended tire pressure on the vehicle's tire information placard, certification label, or in the owner's manual. This Log Splitter has 60 PSI recommended cold tire inflation pressure.
2. Measure and record the tire pressure of all tires.
3. If the tire pressure is too high in any of the tires and the tires have not been driven for at least three hours, slowly release air by gently pressing on the tire valve stem with the edge of your tire gauge until you get to the correct pressure. If the vehicle has been driven within the past three hours and the tire pressure is too high on any tires, then recheck the pressure once the tires have been allowed to sit motionless for at least three hours.
4. If the tire pressure is too low, note the difference between the measured tire pressure and the correct tire pressure. These "missing" pounds of pressure are what you will need to add.
5. At a service station, add the missing pounds of air pressure to each tire that is underinflated.
6. Check all the tires to make sure they have the same air pressure.
7. If the tires' pressure was not measured "cold", then the pressure should be rechecked with the tires cold as soon as possible.

Tire Size

To maintain safety, only purchase new tires of the same size as the original tires.
Look at the Tire and Loading Information Placard, the Specifications Chart in this manual, or the sidewall of the tire being replaced. If you have any doubt about selecting the correct size, consult a tire dealer.

Tire Tread

The tire tread provides traction that prevents your vehicle from slipping, especially if the road is wet or icy.
Tires are unsafe and should be replaced when the tread is worn down to 1/16″.
Measure tread depth using a tread depth indicator (not included).

Tire Rotation

Every 5,000 miles the left and right tires should be switched.
This will cause the tires to wear more evenly and last longer.

Tire Balance and Alignment

The tires need to be balanced to prevent vibration when driving. This involves attaching small weights to the rim to offset small differences in rim and tire weight. The tires also need to be aligned properly. Alignment is the orientation of the tires to the road surface and their being parallel. This helps the tires to wear evenly, and provide better traction. Both tire balance and alignment require specialized equipment that is not provided with this equipment.

Tire Repair

To properly repair a punctured tire, the hole needs to be properly plugged and patched from the inside of the tire. Tread punctures can be repaired if they are not too large. Sidewall punctures should not be repaired, the tire needs to be replaced if the sidewall is damaged. Tires should be removed from the rim to be inspected before being plugged and patched. A qualified mechanic should remove the tire from the rim, perform the repair, and remount the tire.

⚠WARNING

TO PREVENT SERIOUS INJURY FROM ACCIDENTAL STARTING: Turn the Power Switch of the equipment to its "OFF" position, wait for the engine to cool, disconnect the spark plug cap, and move the Control Handle forward and back to relieve hydraulic system pressure before performing any inspection, maintenance, or cleaning procedures.

TO PREVENT SERIOUS INJURY FROM EQUIPMENT FAILURE: Do not use damaged equipment. If abnormal noise, vibration, or excess smoking occurs, have the problem corrected before further use.

Follow all service instructions in this manual. The engine may fail critically if not serviced properly.

Many maintenance procedures, including any not detailed in this manual, will need to be performed by a qualified technician for safety. If you have any doubts about your ability to safely service the equipment or engine, have a qualified technician service the equipment instead.

Cleaning, Maintenance, and Lubrication Schedule

Note: This maintenance schedule is intended solely as a general guide. If performance decreases or if equipment operates unusually, check systems immediately. The maintenance needs of each piece of equipment will differ depending on factors such as duty cycle, temperature, air quality, fuel quality, and other factors.

Note: The following procedures are in addition to the regular checks and maintenance explained as part of the regular operation of the engine and equipment.

Procedure	Before Each Use	Monthly or every 20 hr. of use	Every 3 mo. or 50 hr. of use	Every 6 mo. or 100 hr. of use	Yearly or every 300 hr. of use	Every 2 Years
1. Brush off outside of engine 2. Check engine oil level 3. Check hydraulic fluid level	✓	✓	✓	✓	✓	✓
Check air cleaner	✓		✓	✓	✓	✓
Check sediment cup	✓			✓	✓	✓
Change engine oil		✓		✓	✓	✓
1. Change hydraulic fluid 2. Check and clean spark plug				✓	✓	✓
Clean air filter			✓*	✓	✓	✓
1. Check/adjust idle speed 2. Check/adjust valve clearance 3. Clean fuel tank, strainer and carburetor 4. Clean carbon build-up from combustion chamber					✓**	✓**
Replace fuel line if necessary						✓**

*Service more frequently when used in dusty areas.

**These items should be serviced by a qualified technician.

Bleeding the Hydraulic System

1. Remove the Fluid Fill Plug and check the hydraulic fluid level using the dipstick attached to the Plug.
2. Add sufficient fluid (not included) as needed to bring up to full level. Replace Fluid Fill Plug.
3. Start the engine and use the Control Handle to cycle the Cutting Wedge forward and back several times to remove excess air from the Fluid Tank.
4. Retract the Cutting Wedge, recheck the hydraulic fluid level and add fluid if necessary to bring up to full level.
5. Replace the Fluid Fill Plug.

Replacing Hydraulic Fluid

Change the hydraulic fluid in the Log Splitter after every 100 hours of use.

1. Allow hydraulic fluid to cool completely before changing. Place an appropriate three gallon or greater capacity container under the Fluid Tank.
2. Remove the Fluid Drain Plug and drain the fluid reservoir. Dispose of the old hydraulic fluid in accordance with local regulations.
3. Replace the Fluid Drain Plug, remove the Fluid Fill Plug and fill the Fluid Tank with 2.25 gallons (8.5 liters) of fresh 10W AW32, ASLE H-150 or ISO32 hydraulic fluid (not included).

Note: If using the Log Splitter for extended periods in outdoor temperatures above 70° F, the use of Dextron III automatic transmission fluid (not included) is recommended. DO NOT mix Dextron III with other types of hydraulic fluid—drain reservoir completely if substituting Dextron III.

4. Check the hydraulic fluid level using the dipstick attached to the Fluid Fill Plug.
5. Add sufficient fluid (not included) as needed to bring up to full level. Replace Fluid Fill Plug.
6. Start the engine and use the Control Handle to cycle the Cutting Wedge forward and back several times to remove excess air from the Fluid Tank.
7. Retract the Cutting Wedge, recheck the hydraulic fluid level and add fluid if necessary to bring up to full level.
8. Replace the Fluid Fill Plug.

Checking and Filling Fuel

⚠WARNING! TO PREVENT SERIOUS INJURY FROM FIRE:
Fill the fuel tank in a well-ventilated area away from ignition sources. If the engine is hot from use, shut the engine off and wait for it to cool before adding fuel. Do not smoke.

1. Clean the Fuel Cap and the area around it.
2. Unscrew and remove the Fuel Cap.
3. Remove the Strainer and remove any dirt and debris. Then replace the Strainer.

Note: Do not use gasoline containing more than 10% ethanol (E10). Do not use E85 ethanol. Add fuel stabilizer to the gasoline or the Warranty is VOID.

Note: Do not use gasoline that has been stored in a metal fuel container or a dirty fuel container. It can cause particles to enter the carburetor, affecting engine performance and/or causing damage.

4. If needed, fill the Fuel Tank to about 1 inch under the fill neck of the Fuel Tank with 87 octane or higher unleaded gasoline that has been treated with a fuel stabilizer additive. Follow fuel stabilizer manufacturer's recommendations for use.
5. Then replace the Fuel Cap.
6. Wipe up any spilled fuel and allow excess to evaporate before starting engine. To prevent FIRE, do not start the engine while the smell of fuel hangs in the air.

Air Filter Element Maintenance

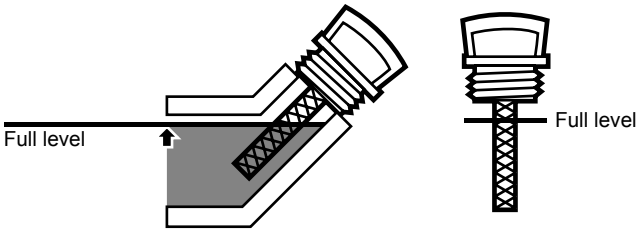
1. Remove the Air Cleaner Cover and the air filter(s) and check for dirt. Clean as described below.
2. **Cleaning:**
   - For paper filters:
     To prevent injury from dust and debris, wear ANSI-approved safety goggles, NIOSH-approved dust mask/respirator, and heavy-duty work gloves. In a well-ventilated area away from bystanders, use pressurized air to blow dust out of the filter.
   - For foam filters:
     Wash the filter in warm water and mild detergent several times. Rinse. Squeeze out excess water and allow it to dry completely. Soak the filter in lightweight oil briefly, then squeeze out the excess oil.
3. Install the cleaned filter(s). Secure the Air Cleaner Cover before use.

Maintenance (continued)

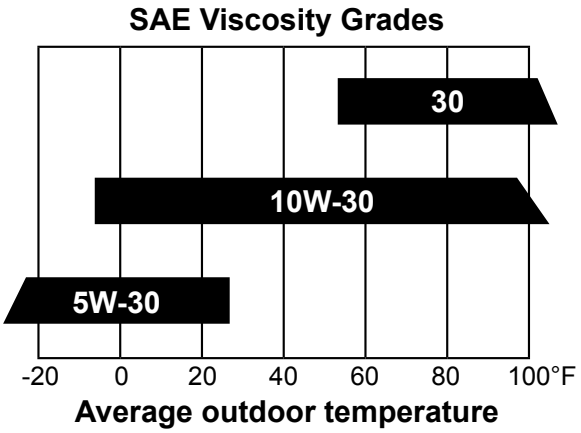
Engine Oil Change

⚠**CAUTION!** Oil is very hot during operation and can cause burns. Wait for engine to cool before changing oil.

1. Make sure the engine is stopped and is level.
2. Close the Fuel Valve.
3. Place a drain pan (not included) underneath the crankcase's drain plug.
4. Remove the drain plug and, if possible, tilt the crankcase slightly to help drain the oil out. Recycle used oil.
5. Replace the drain plug and tighten it.
6. Clean the top of the Dipstick and the area around it. Remove the Dipstick by turning it counterclockwise, and wipe it off with a clean, lint free rag.



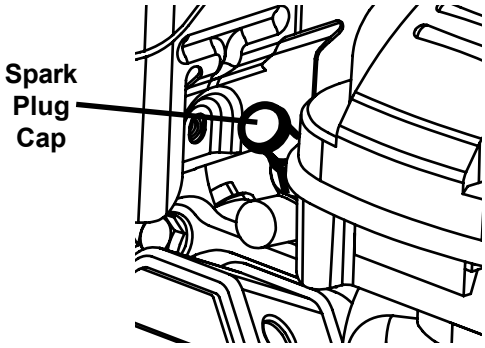
7. Add the appropriate type of oil until the oil level is at the full level. SAE 10W-30 oil is recommended for general use.
   The SAE Viscosity Grade chart shows other viscosities to use in different average temperatures.



8. Thread the dipstick back in clockwise.

NOTICE: Do not run the engine with too little oil. Engine **will not start with low or no engine oil.**

Spark Plug Maintenance



1. Disconnect spark plug cap from end of plug. Clean out debris from around spark plug.
2. Using a spark plug wrench, remove the spark plug.
3. Inspect the spark plug:
   If the electrode is oily, clean it using a clean, dry rag. If the electrode has deposits on it, polish it using emery paper. If the white insulator is cracked or chipped, the spark plug needs to be replaced.

Recommended Spark Plugs	
NGK®	BP-6ES
NHSP® / TORCH®	F6TC

NOTICE: Using an incorrect spark plug may damage the engine.

4. When installing a new spark plug, adjust the plug's gap to the specification on the Specifications chart. Do not pry against the electrode, the spark plug can be damaged.
5. Install the new spark plug or the cleaned spark plug into the engine.
   - **Gasket-style**: Finger-tighten until the gasket contacts the cylinder head, then tighten about 1/2-2/3 turn more.
   - **Non-gasket-style**: Finger-tighten until the plug contacts the cylinder head, then tighten about 1/16 turn more.

NOTICE: Tighten the spark plug properly.
If loose, the spark plug will cause the engine to overheat.
If overtightened, the threads in the engine block will be damaged.

6. Apply dielectric spark plug boot protector (not included) to the end of the spark plug and reattach the wire securely.

Tires

1. Periodic inspection and maintenance of tires and wheels are essential to towing safety, including spare tires. Proper tire pressure affects vehicle handling and the safety of your tires.
2. Underinflation reduces the load-carrying capacity of your tow vehicle or trailer, may cause sway and control problems, and may result in overheating, causing blowouts or other tire failure.
3. Overinflation causes premature tire wear and affects the handling characteristics of the tow vehicle or trailer.

Long-Term Storage

When the equipment is to remain idle for longer than 20 days, prepare the Engine for storage as follows:

1. **CLEANING**:
   Wait for Engine to cool, then clean Engine with dry cloth. **NOTICE: Do not clean using water.** The water will gradually enter the Engine and cause rust damage. Apply a thin coat of rust preventive oil to all metal parts.
2. **FUEL:**

   To protect the fuel tank during storage, fill the tank with gasoline that has been treated with a fuel stabilizer additive. Follow fuel stabilizer manufacturer's recommendations for use. Refer to *Checking and Filling Fuel* on page 11.

   ⚠WARNING! TO PREVENT SERIOUS INJURY FROM FIRE:
   Fill tank in a well-ventilated area away from ignition sources. If the engine is hot from use, shut the engine off and wait for it to cool before adding fuel. Do not smoke.
3. **LUBRICATION:**
   a. Change engine oil.
   b. Clean out area around spark plug. Remove spark plug and pour one tablespoon of engine oil into cylinder through spark plug hole.
   c. Replace spark plug, but leave spark plug cap disconnected.
   d. Pull Starter Handle to distribute oil in cylinder. Stop after one or two revolutions when you feel the piston start the compression stroke (when you start to feel resistance).
4. **STORAGE AREA:**
   Cover and store in a dry, level, well-ventilated area out of reach of children. Storage area should also be away from ignition sources, such as water heaters, clothes dryers, and furnaces.

NOTICE: During extended storage periods the Engine must be started every 3 months and allowed to run for 15–20 minutes or the Warranty is VOID.

5. **AFTER STORAGE:**
   Before starting the Engine during or after storage, keep in mind that untreated gasoline will deteriorate quickly. Drain the fuel tank and change to fresh fuel if untreated gasoline has been sitting for a month, if treated gasoline has been sitting beyond the fuel stabilizer's recommended time period, or if the Engine does not start.

Troubleshooting

Problem	Possible Causes	Probable Solutions
Engine will not start	FUEL RELATED:	FUEL RELATED:
	1. No fuel in tank or fuel valve closed.	1. Fill fuel tank with fresh 87+ octane stabilizer-treated unleaded gasoline and open fuel valve. **Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).**
	2. Choke not in START position, cold engine.	2. Move Choke to START position.
	3. Gasoline with more than 10% ethanol used. (E15, E20, E85, etc.)	3. Clean out ethanol rich gasoline from fuel system. Replace components damaged by ethanol. Use fresh 87+ octane stabilizer-treated unleaded gasoline only. **Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).**
	4. Low quality or deteriorated, old gasoline.	4. Use fresh 87+ octane stabilizer-treated unleaded gasoline. **Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).**
	5. Carburetor not primed.	5. Pull on Starter Handle to prime.
	6. Dirty fuel passageways.	6. Clean out passageways using fuel additive. Heavy deposits may require further cleaning.
	7. Carburetor needle stuck. Fuel can be smelled in the air.	7. **Gently** tap side of carburetor float chamber with screwdriver handle.
	8. Too much fuel in chamber. This can be caused by the carburetor needle sticking.	8. Turn Choke to RUN position. Remove spark plug and pull the start handle several times to air out the chamber. Reinstall spark plug and set Choke to START position.
	9. Clogged Fuel Filter.	9. Replace Fuel Filter.
	IGNITION (SPARK) RELATED:	IGNITION (SPARK) RELATED:
	1. Spark plug cap not connected securely.	1. Connect spark plug cap properly.
	2. Spark plug electrode wet or dirty.	2. Clean spark plug.
	3. Incorrect spark plug gap.	3. Correct spark plug gap.
	4. Spark plug cap broken.	4. Replace spark plug cap.
	5. Incorrect spark timing or faulty ignition system.	5. Have qualified technician diagnose/ repair ignition system.
	COMPRESSION RELATED:	COMPRESSION RELATED:
	1. Cylinder not lubricated. Problem after long storage periods.	1. Pour tablespoon of oil into spark plug hole. Crank engine a few times and try to start again.
	2. Loose or broken spark plug. (Hissing noise will occur when trying to start.)	2. Tighten spark plug. If that does not work, replace spark plug. If problem persists, may have head gasket problem, see #3.
	3. Loose cylinder head or damaged head gasket. (Hissing noise will occur when trying to start.)	3. Tighten head. If that does not remedy problem, replace head gasket.
	4. Engine valves or tappets mis-adjusted or stuck.	4. Have qualified technician adjust/ repair valves and tappets.
	ENGINE OIL RELATED:	ENGINE OIL RELATED:
	1. Low engine oil.	1. Fill engine oil to proper level. Check engine oil before EVERY use.
	2. Engine mounted on slope, triggering low oil shutdown.	2. Operate engine on level surface. Check engine oil level.

Follow all safety precautions whenever diagnosing or servicing the equipment or engine.

Problem	Possible Causes	Probable Solutions
Engine misfires	1. Spark plug cap loose. 2. Incorrect spark plug gap or damaged spark plug. 3. Defective spark plug cap. 4. Old or low quality gasoline. 5. Incorrect compression.	1. Check cap and wire connections. 2. Re-gap or replace spark plug. 3. Replace spark plug cap. 4. Use only fresh 87+ octane stabilizer-treated unleaded gasoline. **Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).** 5. Diagnose and repair compression. (Use **Engine will not start: COMPRESSION RELATED** section.)
Engine stops suddenly	1. Fuel tank empty or full of impure or low quality gasoline. 2. Low oil shutdown. 3. Defective fuel tank cap creating vacuum, preventing proper fuel flow. 4. Faulty magneto. 5. Disconnected or improperly connected spark plug cap.	1. Fill fuel tank with fresh 87+ octane stabilizer-treated unleaded gasoline. **Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).** 2. Fill engine oil to proper level. Check engine oil before EVERY use. 3. Test/replace fuel tank cap. 4. Have qualified technician service magneto. 5. Secure spark plug cap.
Engine stops when under heavy load	1. Dirty air filter 2. Engine running cold.	1. Clean element. 2. Allow engine to warm up prior to operating equipment.
Engine knocks	1. Old or low quality gasoline. 2. Engine overloaded. 3. Incorrect spark timing, deposit buildup, worn engine, or other mechanical problems.	1. Fill fuel tank with fresh 87+ octane stabilizer-treated unleaded gasoline. **Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).** 2. Do not exceed equipment's load rating. 3. Have qualified technician diagnose and service engine.
Engine backfires	1. Impure or low quality gasoline. 2. Engine too cold. 3. Intake valve stuck or overheated engine. 4. Incorrect timing.	1. Fill fuel tank with fresh 87+ octane stabilizer-treated unleaded gasoline. **Do not use gasoline with more than 10% ethanol (E15, E20, E85, etc.).** 2. Use cold weather fuel and oil additives to prevent backfiring. 3. Have qualified technician diagnose and service engine. 4. Check engine timing.
After sudden impact, engine will run, but equipment will not operate	Shaft key or other shear pin broken by impact to disconnect engine and limit damage.	Have qualified technician check and replace broken shaft key or other shear pins.

Follow all safety precautions whenever diagnosing or servicing the equipment or engine.

Problem	Possible Causes	Probable Solutions
Wood will not split, or splits extremely slowly	1. Hydraulic fluid level is low. 2. Air trapped in the hydraulic system. 3. Excessive pump inlet vacuum. 4. Low control valve setting. 5. Leaking control valve. 6. Internally damaged cylinder.	1. Check fluid level and add fluid as needed. 2. Bleed hydraulic system. 3. Check pump inlet hose for blockage or kinks. 4. Have qualified technician adjust control valve with a pressure gauge. 5. Have qualified technician service tool. 6. Have qualified technician service tool.
Slow cylinder shaft speed	1. Hydraulic fluid level is low. 2. Air trapped in the hydraulic system. 3. Excessive pump inlet vacuum. 4. Leaking or damaged control valve. 5. Internally damaged cylinder.	1. Check fluid level and add fluid as needed. 2. Bleed hydraulic system. 3. Check pump inlet hose for blockage or kinks. 4. Have qualified technician service tool. 5. Have qualified technician service tool.
Cylinder rod will not move	1. Hydraulic fluid level is low. 2. Blocked hydraulic lines or control valve. 3. Damaged control valve. 4. Damaged cylinder piston.	1. Check fluid level and add fluid as needed. 2. Flush and clean hydraulic system. 3. Have qualified technician service tool. 4. Have qualified technician service tool.
Engine bogs down during splitting	High control valve setting.	Have qualified technician adjust control valve with a pressure gauge.
Engine stalls under light load	Blocked hydraulic lines or control valve.	Flush and clean hydraulic system.

Follow all safety precautions whenever diagnosing or servicing the equipment or engine.

Limited 90 Day Warranty (Retail)

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that this product is free from defects in materials and workmanship for the period of 90 days from the date of purchase. This warranty does not apply to damage due directly or indirectly, to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities, criminal activity, improper installation, normal wear and tear, or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS, EXCEPT FOR THE EMISSIONS CONTROL SYSTEM WARRANTY BELOW.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Emissions Control System Warranty

Harbor Freight Tools (HFT) is pleased to explain the emissions control system warranty on your Small Off-Road Engine produced after January 1, 2015 (engine), in addition to the Retail Warranty above. HFT warrants that the emissions control system on your engine is designed, built, and equipped so that it conforms to the United States Environmental Protections Agency's (EPA) emissions requirements in effect at the time of manufacture. HFT also warrants that the emissions control system on your engine will be free from defects in material and workmanship for two (2) years, provided there has been no improper maintenance, misuse, or abuse of your engine.

Your emissions control system may include parts such as the carburetor or fuel-injection system, and the ignition system. Also included may be hoses, belts, connectors and other emissions-related assemblies.

WHAT WE WILL DO

Where a warrantable condition exists, HFT will repair or replace, at our option, any emissions-related part on your engine if it becomes defective, malfunctions, or otherwise fails to conform with this warranty under normal use and service during the two (2) year term of this warranty at no cost to you, including diagnosis, parts and labor. This warranty applies to the original purchaser and any subsequent owner within the two year warranty period.

WHAT IS COVERED?

The following parts are examples of components of the emissions control system and are covered by this two (2) year warranty. For a full list of emissions control components covered by this warranty, please see 40 CFR §1068, Appendix I.

1. Fuel Metering System
   a. Carburetor and its internal parts.
   b. Fuel pump (if so equipped).
   c. Cold start enrichment system.
2. Air Induction System
   a. Intake pipe/manifold.
   b. Air cleaner.
3. Ignition System
   a. Spark plug.
   b. Magneto ignition system.
4. Catalyst System (if so equipped)
   a. Exhaust pipe stud.
   b. Muffler.
   c. Catalytic converter (if so equipped).
5. Miscellaneous Items Used in Above Systems
   a. Vacuum, temperature and time sensitive valves and switches.
   b. Hoses, belts, connectors, and assemblies.

This warranty does not cover normal maintenance services or replacement of maintenance items such as filters, oils, or spark plugs.

WHAT YOU MUST DO TO OBTAIN WARRANTY SERVICE

As the engine owner, you are responsible for the performance of the required maintenance listed in your Owner's Manual. HFT may deny you warranty coverage if your engine or a part has failed due to abuse (including failure to follow the fuel use instructions contained in this manual), neglect, improper maintenance, or unapproved modifications.

In order to obtain warranty repair or replacement, you may either (a) contact HFT product support at 1-888-866-5797 or productsupport@harborfreight.com; or (b) bring the to your nearest Harbor Freight Tools retail store. When going to the retail store or contacting product support, you must indicate the specific emissions control part or defect that you are claiming and the date this was originally purchased. The nearest Harbor Freight Tools retail store can be found on the internet at http://www.harborfreight.com.

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PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS LIST AND ASSEMBLY DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER OR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT, OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS, AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

Record Product's Serial Number Here: _____

Note: If product has no serial number, record month and year of purchase instead.

Note: Some parts are listed and shown for illustration purposes only, and are not available individually as replacement parts.

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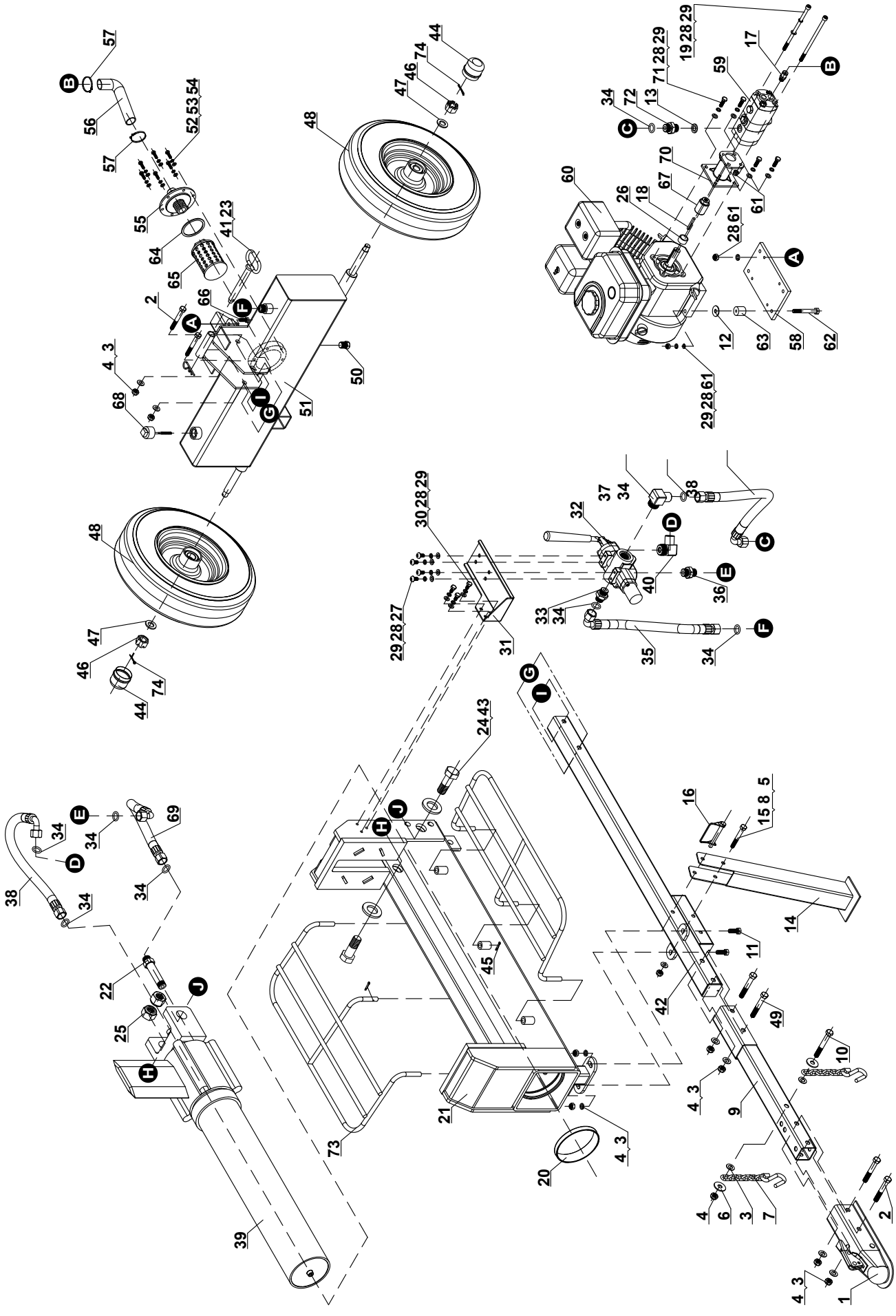
Main Parts List

Part	Description	Qty
1	2" Hitch Coupler	1
2	Bolt M12x80	4
3	Flat Washer Ø12	10
4	Lock Nut M12	9
5	Lock Nut M10	1
6	Big Flat Washer Ø12	2
7	Hook Chain	2
8	Flat Washer Ø10	1
9	Front Tow Bar	1
10	Bolt M12x90	1
11	Bolt M12x35	2
12	Big Flat Washer Ø10	4
13	Composite Washer	1
14	Support Leg	1
15	Bolt M10x75	1
16	Lock Pin	1
17	Fluid Connector	1
18	Engine Flat Key	1
19	Inner Hex Screw M8x165	2
20	Cylinder Guide Bushing	1
21	Beam	1
22	Extension NPT 1/2"-7/8"	1
23	R-Pin	1
24	Bolt M24x64	2
25	Lock Nut M24	2
26	Engine Bushing	1
27	Screw M8x16	4
28	Lock Washer Ø8	20
29	Flat Washer Ø8	16
30	Bolt M8x16	3
31	Mounting Plate	1
32	Control Valve	1
33	Connector NPT 3/4"-7/8"	1
34	O-Ring	8
35	Hydraulic Hose (Fluid Tank)	1
36	Connector NPT 1/2"-7/8"	1
37	Connector NPT 3/4"-7/8"	1

Part	Description	Qty
38	Hydraulic Hose (Gear Pump)	2
39	Cylinder	1
40	Connector NPT 1/2"-7/8"	1
41	Hinge Pin	1
42	Tow Bar	1
43	Flat Washer Ø24	2
44	Axle Cap	2
45	Cotter Pin 3x30	2
46	Castle Nut M20	2
47	Flat Washer Ø20	2
48	Wheel	2
49	Bolt M12x75	2
50	Fluid Drain Plug	1
51	Fluid Tank	1
52	Bolt M6x20	6
53	Lock Washer Ø6	6
54	Flat Washer Ø6	6
55	Filter Fix Plate	1
56	Return Hose	1
57	Hose Clamp	2
58	Engine Connecting Plate	1
59	Hydraulic Pump	1
60	Engine	1
61	Lock Nut M8	9
62	Bolt M8x75	4
63	Block	4
64	Rubber Washer	1
65	Filter	1
66	Bolt M8x30	4
67	Coupler	1
68	Fluid Fill Plug	1
69	Hydraulic Hose (Cylinder End Cap)	1
70	Gear Pump Stand	1
71	Bolt M8x25	4
72	Connector	1
73	Log Cradle	2
74	Cotter Pin 4x36	2

Main Assembly Diagram

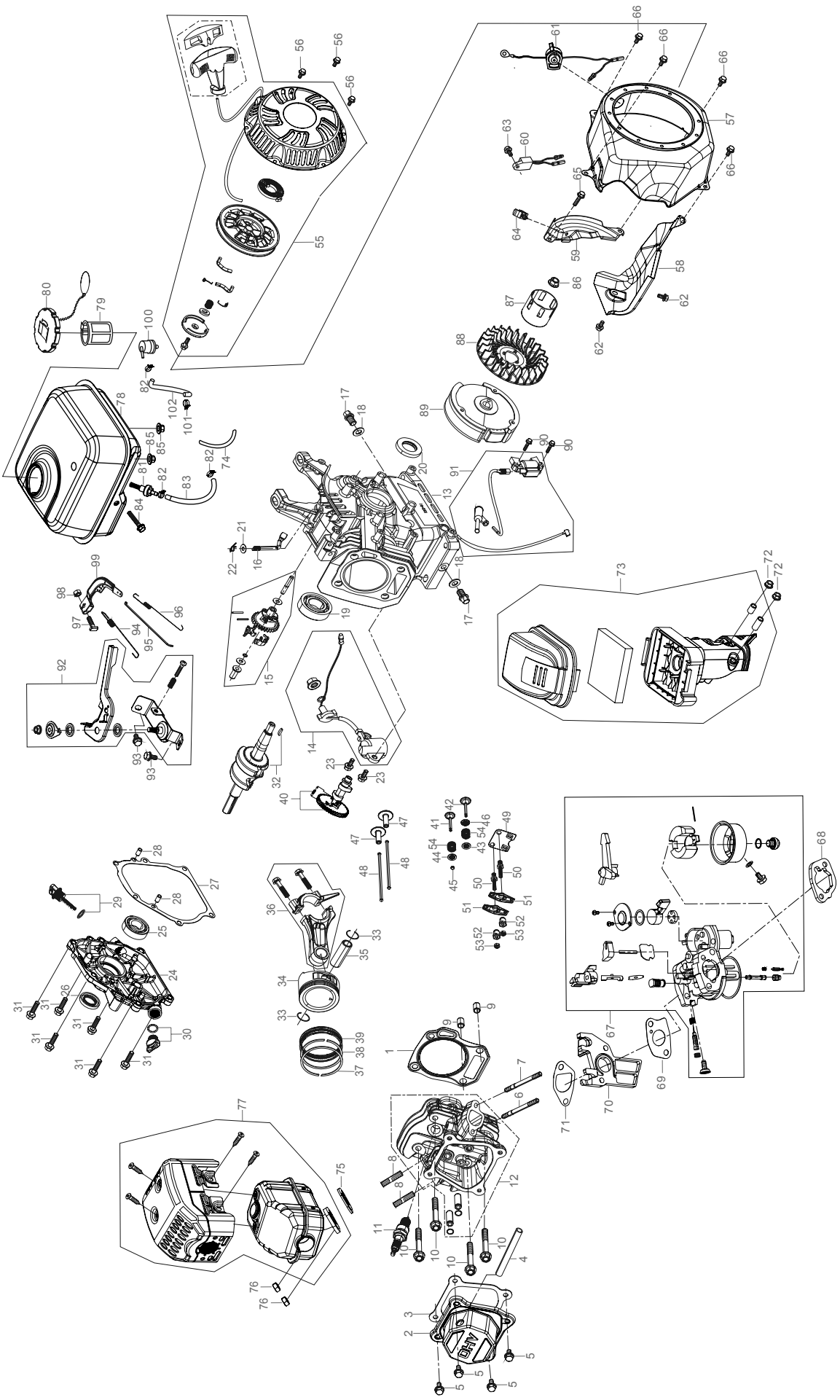


Engine Parts List

Part	Description	Qty
1	Gasket, Cylinder Head	1
2	Cover Subassembly, Cylinder Head	1
3	Gasket, Cylinder Head Cover	1
4	Tube, Breather	1
5	Bolt	4
6	Stud	1
7	Stud	1
8	Stud	2
9	Pin	2
10	Bolt, Cylinder Head	4
11	Plug, Spark	1
12	Head Subassembly, Cylinder	1
13	Crankcase Subassembly	1
14	Sensor, Engine Oil	1
15	Gear Assy, Governor	1
16	Arm, Governor	1
17	Bolt, Drain Plug	2
18	Washer	2
19	Bearing	1
20	Seal, Oil	1
21	Washer	1
22	Pin	1
23	Bolt	2
24	Cover, Crankcase	1
25	Bearing	1
26	Seal, Oil	1
27	Gasket, Crankcase	1
28	Pin	2
29	Dipstick Subassembly, Oil	1
30	Plug Subassembly, Engine Oil	1
31	Bolt	6
32	Crankshaft Assy.	1
33	Clip, Piston Pin	2
34	Piston	1
35	Pin, Piston	1
36	Rod, Connecting	1
37	Ring, Primary	1
38	Ring, Secondary	1
39	Ring Set, Oil	1
40	Camshaft Assy.	1
41	Valve, Exhaust	1
42	Valve, Intake	1
43	Seat, Valve Spring	1
44	Retainer, Exhaust Valve	1
45	Rotator, Valve	1
46	Guide, Seal	1
47	Tappet, Valve	2
48	Lifter, Valve	2
49	Plate Subassembly, Lifter Stopper	1
50	Bolt, Valve Adjusting	2
51	Rocker, Valve	2

Part	Description	Qty
52	Nut, Valve Adjusting	2
53	Nut, Valve Lock	2
54	Spring, Valve	2
55	Starter Assy, Recoil	1
56	Bolt	3
57	Shroud	1
58	Shroud, Cylinder Body	1
59	Shield,Lower	1
60	Protector, Oil	1
61	Switch Subassembly, Stop Engine	1
62	Bolt	2
63	Bolt	1
64	Collar	1
65	Bolt	1
66	Bolt	4
67	Carburetor Assy.	1
68	Gasket, Air Cleaner	1
69	Gasket, Carburetor	1
70	Plate, Carburetor Insulator	1
71	Gasket, Carburetor Insulator	1
72	Nut	2
73	Cleaner, Air	1
74	Jacket, Rubber	1
75	Gasket, Exhaust Outlet	1
76	Nut	2
77	Muffler Assy	1
78	Tank, Fuel	1
79	Strainer, Fuel	1
80	Cover, Fuel Tank	1
81	Outlet Subassembly, Fuel Tank Oil	1
82	Clamp	3
83	Tube, Fuel	1
84	Bolt	1
85	Nut	2
86	Nut, Flywheel	1
87	Pulley,Starter	1
88	Impeller	1
89	Flywheel Subassembly	1
90	Bolt	2
91	Coil, Ignition	1
92	Control Assy, Throttle	1
93	Bolt	2
94	Spring, Governor	1
95	Rod, Governor	1
96	Spring, Throttle Valve Returning	1
97	Bolt, Governor Support	1
98	Nut	1
99	Support Subassembly, Governor	1
100	Valve, One Way	1
101	Clamp	1
102	Hose, Fuel Steam Rubber	1

Engine Assembly Diagram



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